Next Generation 9-1-1 – The Future for Emergency Communications

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Your Facilitator Today is:

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What is NG9-1-1 and Why Should We Care?

Today we will cover:

- Current State of 9-1-1
- Limitations of 9-1-1 Today
- What is Next Generation 9-1-1?
- What's In It For Me?
- Why do we need Next Generation 9-1-1?
- What can we expect with Next Generation 9-1-1?
- How can we work together for the Future?

NENA is the Voice of 9-1-1

NENA's Mission Statement

NENA, through public and private industry partnerships, is committed to the technological advancement, availability, accessibility and implementation of a reliable system for requesting emergency assistance. In carrying out its mission, NENA promotes:

Research, planning, training and education.

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It’s Not Just 9-1-1 Anymore!

- With technology available today – we are moving to an Emergency Services System environment.
- We will be sharing networks, bandwidth and data.
- Need to foster partnerships and leverage what we can do for one another.
- Policies & SOPs need to be developed

E9-1-1 Current Requirements

- **Wireline**
  - -No federal requirements
  - -Some state and local requirements
  - -Voluntary industry implementation
- **Wireless**
  - -Federal (FCC) requirements (Docket 94-102)
- **Multi-Line Telephones Systems (MLTS)**
  - -No federal requirements
  - some states have requirements
- **VoIP**
  - -Federal (FCC) requirements (Docket 05-196, 04-36)
- **ADA requirements for TTY**
  - Currently no provisions for Video/IP relay services, text messaging

What We Have Now. . . Different Levels of Service

- **Wireline**
  - Most Reliable Location Technology
  - Selectively Routed to Correct Answering Point
  - Provides Call Back Number and Address
- **Wireless Phase I**
  - Provides Call Back Number
  - Provides Carrier Info and Tower Location
- **Wireless Phase II**
  - Provides Call Back Number
  - Carrier Info & Tower Location
  - Approximate Location based on X & Y Coordinates
  - Accuracy Requirements vary by technology used, and are under review by the FCC
  - 73% of Counties Covered – 91.5% of Population
- **VoIP**
  - IP calls to geographically appropriate PSAP using existing 9-1-1 network
  - Provides Call Back Number and Registered Address

Today's 9-1-1 Challenges: The Digital Divide!

- Over 6,000 Public Safety Answering Points (PSAPs)
- High costs associated with each PSAP
- Costly, aging equipment that needs replacement soon
- Need data bandwidth, modernized network → IP
- Caller location issues
- Need for Interoperability with other agencies (voice and data)
- Funding needed to sustain & advance system

Next Generation 9-1-1 Vision

An evolved, fully-functional, Next Generation 9-1-1 system that is accessible **anytime, anywhere, from any device**.

Why do we need NG9-1-1?

- Current and new `calling' devices
  - Text – IM, SMS, PDAs, other non-voice devices
  - Wireless – WiFi, WiMAX, improved cellular interface, hybrid (cellular/WiFi)
  - Sensors – environmental, alarms, biometric
  - Video, still and motion
- Wide spectrum of users, emergency support needs
  - Hearing impaired, deaf, speech impaired
  - Non-english speaking callers
  - Constantly increasing mobile users – location challenges

Why Do We Need NG9-1-1?

- The old E9-1-1 system design just can't cope
  - **New communications technologies need `plug and play' access and interfaces**
  - **Constant adaptation of E9-1-1 expensive and slow**
  - **Growing data rich environment – E9-1-1 can't handle**
  - **Need data bandwidth, modernized network --> IP**
  - **Need a more flexible and easily controlled 9-1-1 system**
  - **Need nationwide and beyond intercommunication, including other emergency services**
  - **Post transition, NG9-1-1 can be significantly more efficient (and likely less expensive for similar features)**

What is NG9-1-1?

- An IP-Based Replacement for E9-1-1 System Features and Functions
- Supporting all Sources of Emergency Access to the Appropriate PSAP
- Operating on Privately Managed, Multipurpose IP Networks
- Providing Expanded Multimedia Data Capabilities for PSAPs and Other Emergency Communications Entities

NG9-1-1 Building Blocks

Equivalency
To
E9-1-1

NG9-1-1 Building Blocks

Additional Capabilities to meet Current and Future Needs

Equivalency
To
E9-1-1

NG9-1-1 Building Blocks

NG9-1-1

Additional Capabilities to meet Current and Future Needs

Equivalency To E9-1-1

NG9-1-1 Building Blocks

NG9-1-1

Expansion over time

Equivalency
To
E9-1-1

NG9-1-1 Building Blocks

Databases and Data Access

Software Services

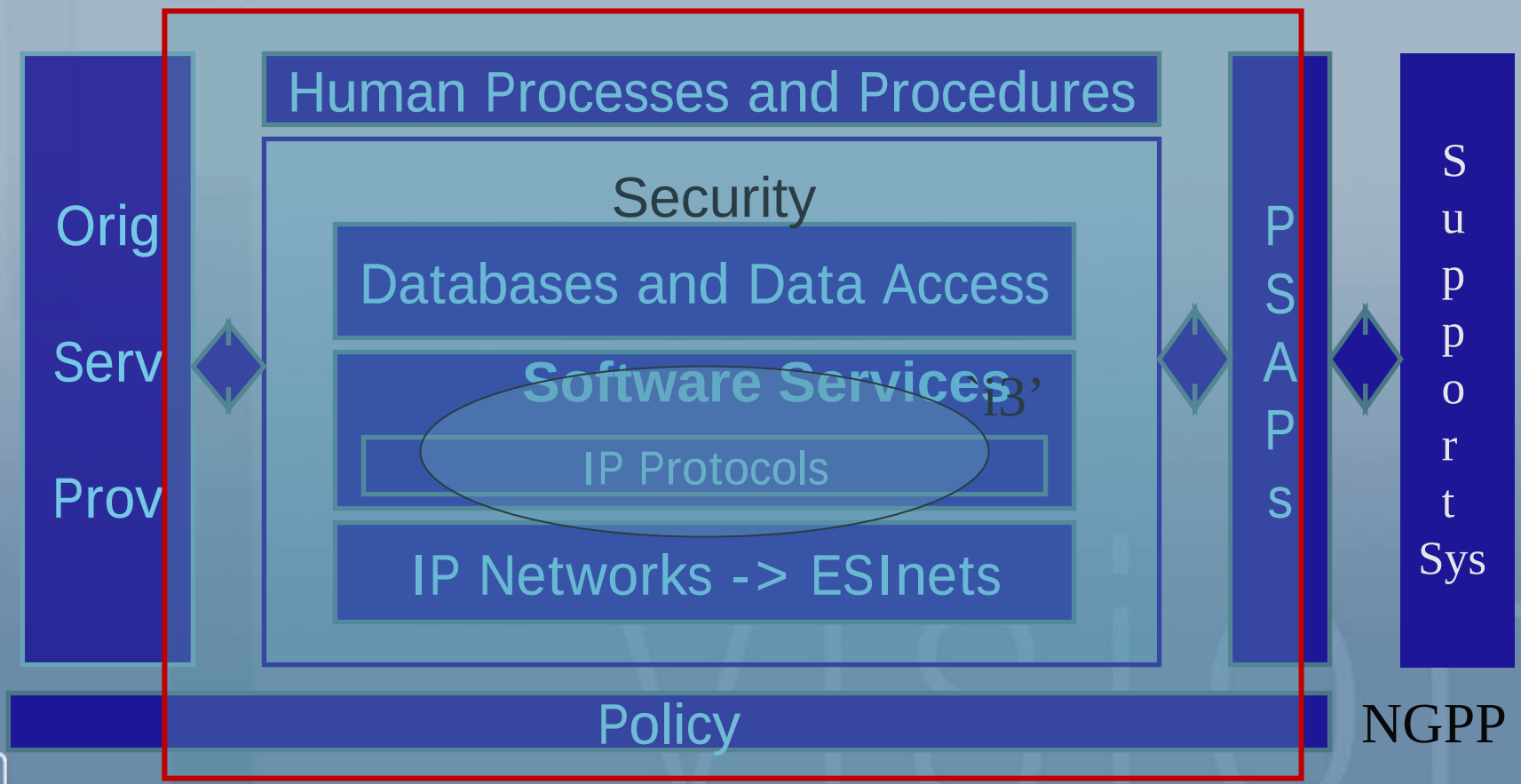
IP Protocols

IP Networks -> ESInets

NG9-1-1 Building Blocks

NG9-1-1 System Standards and Recommendations

SDOs NENA Technical and Operations APCO



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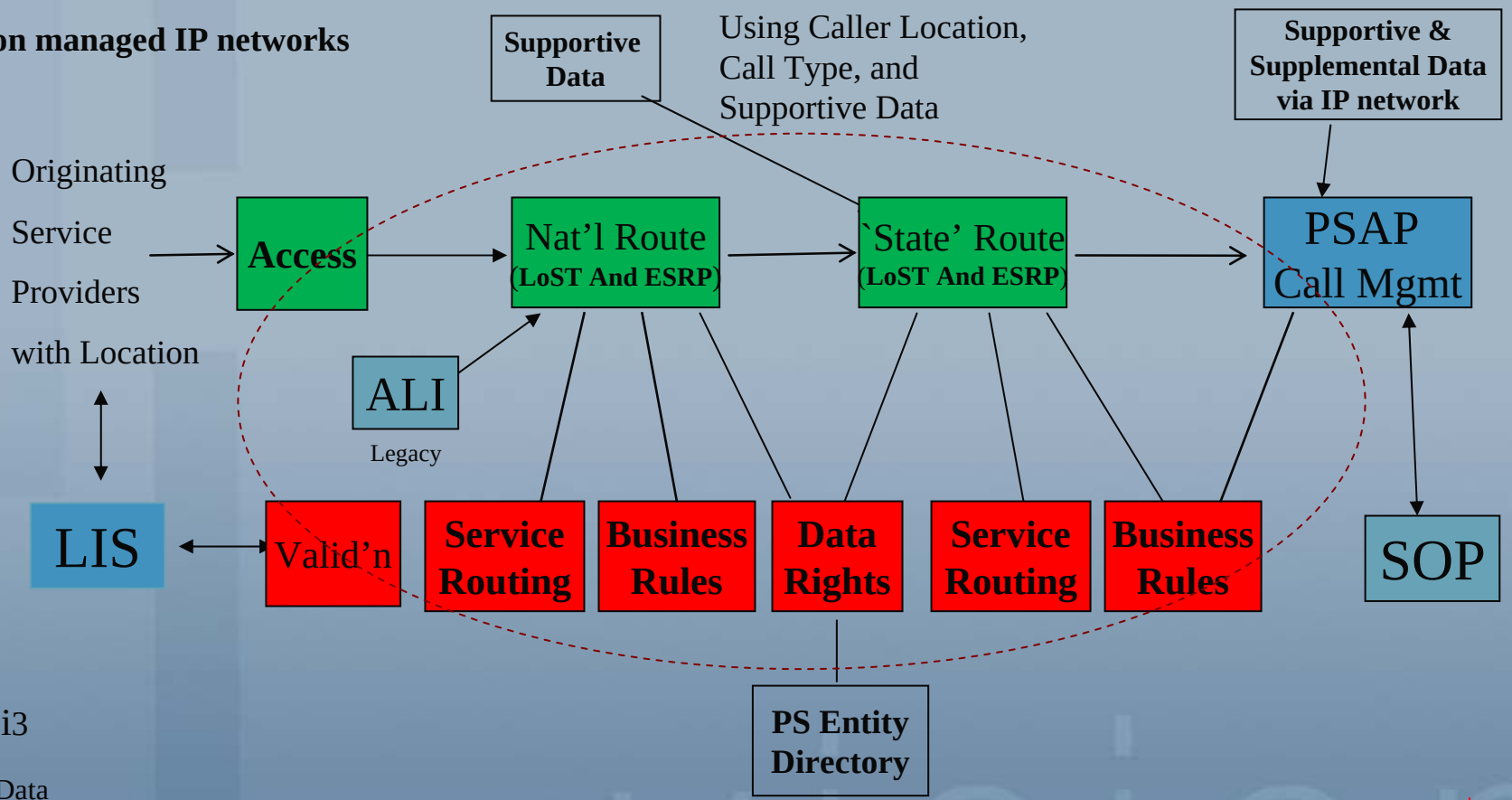
Changed Needs Drive NG9-1-1

- NG9-1-1 will use hardware and network that are not 9-1-1 specific
  - E9-1-1 uses E9-1-1 specific hardware/software and network
- NG9-1-1 is software driven, and controlled by databases
- NG9-1-1 must route calls/messages based on multiple factors
  - E9-1-1 routes primarily on address/location

NG9-1-1 Basic Structure

Software and Data Base Controlled

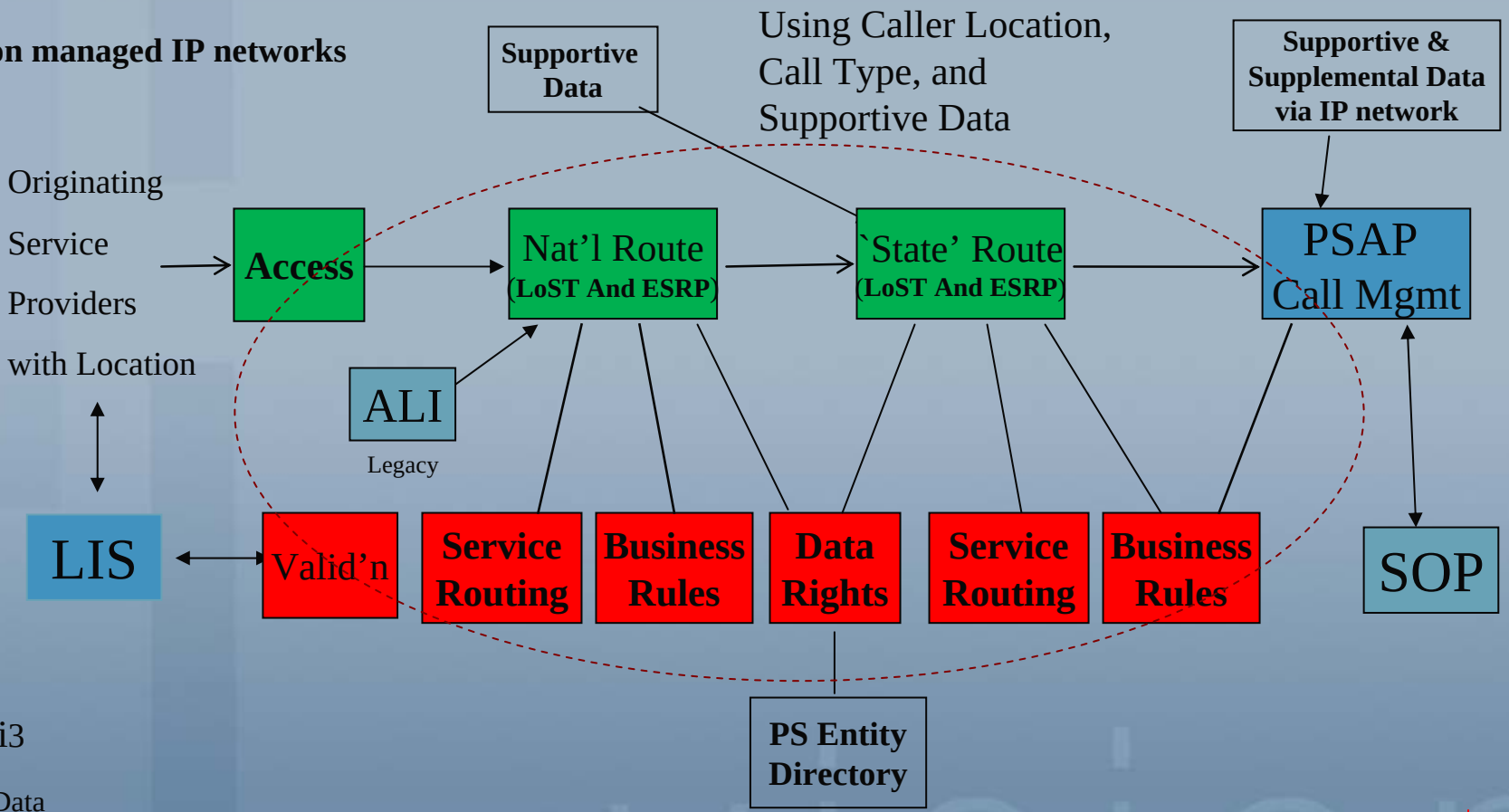
- **Runs on managed IP networks**



NG9-1-1 Basic Structure

Policy Based Routing

- **Runs on managed IP networks**



What's In It For Me?

- More flexibility, and much more direct control through Business Rules data bases
  - Automatic query of supportive data
    - Ex: Building info, medical info, telematics
  - Direct control of alternate routing
  - Pre-definition of disaster routing
  - Inter-network access to other PSAPs
  - Inter-network access to other databases
- Cost savings through optional use of shared software services at the NG9-1-1 system level, rather than each PSAP

NG9-1-1 proposed feature examples

- Support call routing and call processing based on characteristics data, such as language preference and/or calltaker skills, based on call stream data items or business rules information. Examples: ASL over video, or adding an interpretation service automatically to the call before or at presentation to the calltaker

- Dynamic data streaming during the call. Examples:
  - Personal telematics data from heart monitoring vest, dynamically updated during the call progress
  - Video of the scene for real time verification, info

NG9-1-1 proposed feature examples

- Optional ability to pass certain calls directly to dispatch or responding agency based on call type, call priority and circumstances indicated by Essential and/or Supportive data items. Controllable by business rules database entries. Examples:

  sensor data and alarms, high priority telematics calls

- Manually query expanded sets of supplemental databases after call delivery to the PSAP, via the NG9-1-1 network

Changed Needs Drive NG9-1-1

- NG9-1-1 will handle many more types of devices
  - Voice, text, images, data only (such as sensors)
  - Routing and control functions will support more than just 9-1-1, such as N-1-1s and others, over a common network
- NG9-1-1 functions can/will route to emergency entities other than PSAPs, including 211, 311, N11 centers, and allow transfer between them all
- Supports Virtual PSAPs (distributed calltakers)

Who is defining NG9-1-1?

- NENA
  - Future Path Plan in 2001
  - Started development work in 2003
- Internet Engineering Task Force (IETF)
- International Standards Development Orgs (SDOs)

  predominantly about service provider standards and location determination
- USDOT project – RFP in 2006, 2007-2008 project → POC
- Commercial companies are developing parts of NG9-1-1, in view of developing standards

Who is defining NG9-1-1?

- The NENA-IETF effort is about IP protocols and architecture – functions and interfaces
- NENA's Long Term Development working group also defined a Location ID requirements document used by other SDOs
- NENA has a NG9-1-1 Data Development working group
- NENA also has a NG9-1-1 Transition Planning committee

NENA Development Structure

Technical Committee - technical development

Operations Committee – operations development

Next Generation Partner Program: policy issues around NG 9-1-1 and NG emergency communications

Transition Planning Committee – transition guidelines

NENA Certification and Accreditation effort

How is NG9-1-1

going to affect YOU?

NG9-1-1 Impacts on PSAPs

- The calltaker job today is different and more sophisticated than 15, 10, or even 5 years ago. NG9-1-1 continues that evolution to meet new needs, but also with more optional features and flexibility to make the changes workable.
  - Expect changes to the call taking software you use
  - Expect to have access to more and better information
    - NG9-1-1 will not force added data to the calltaker
  - Expect changes in the way you do your jobs

NG9-1-1 Impact on PSAPs

- Handling calls from new devices and ability to transfer calls with location and all associated data will require new processes and procedures for call takers
- Access to additional data will require new call taker processes and procedures
- New databases will require new processes and procedures for call takers, database administrators and PSAP management
- Access to more information may involve new decision support tools that help control and interpret data for call takers and dispatchers
- Improved connectivity will create new relationships among PSAPs and other local, regional and national emergency agencies, requiring new processes and procedures for call takers and management

NG9-1-1 Impacts on 9-1-1 Authorities

Active system management moving toward 9-1-1 Authorities

- Open architecture, open competition options

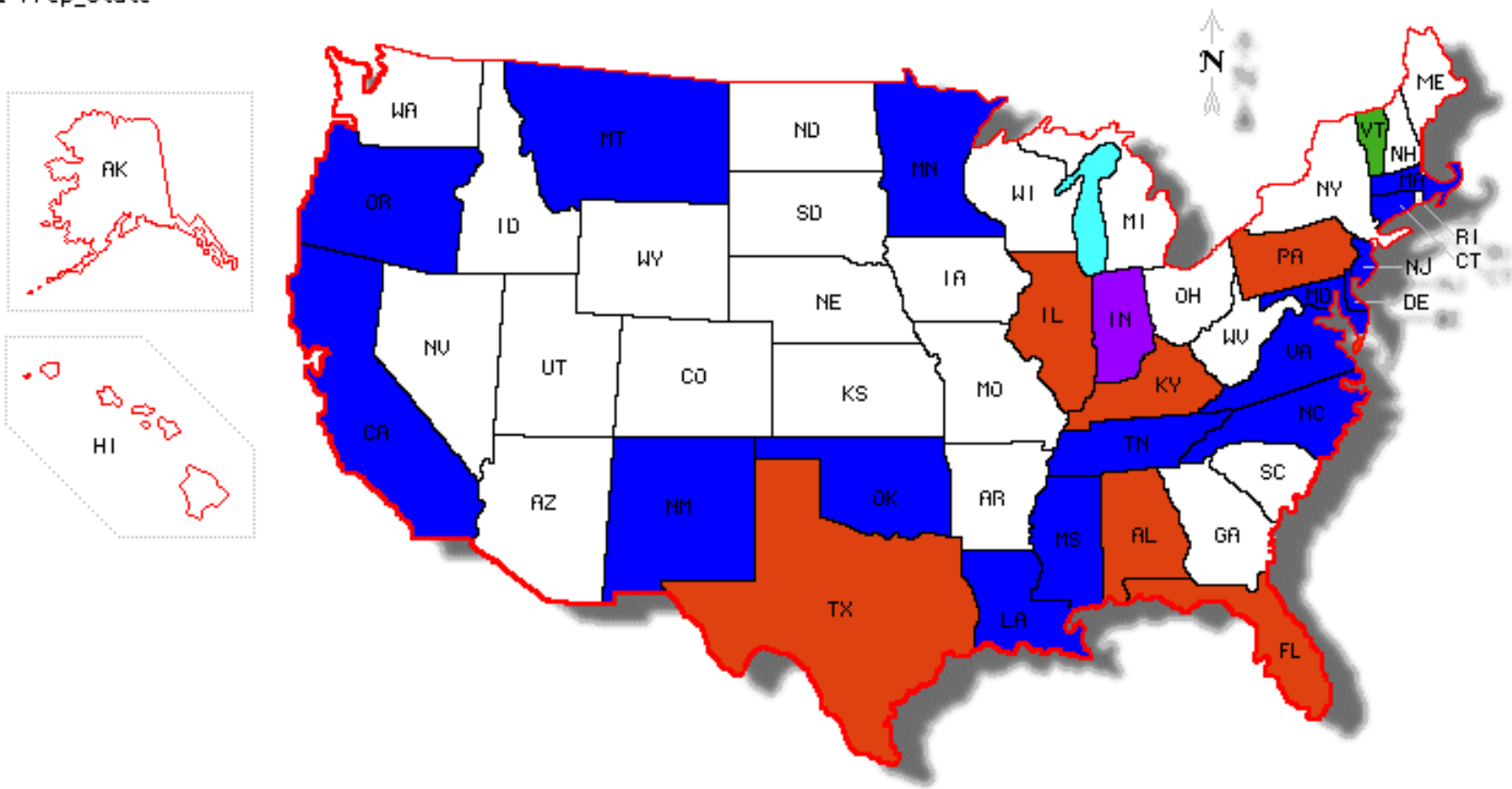
- IP network management, both local and wider areas
- Management of expanded databases
  - **Authentication processes, user authorization management**
  - **Validation**
  - **Routing**
  - **Data Sources**
  - **Data Rights management**
  - **Business Rules (including activation / management of optional features)**
  - **Public Services Entity directory**
  - **SOP databases**

Real World Applications

- Statewide next generation network projects in process today in Indiana, Montana, Vermont and Rhode Island, Texas, Florida, Minnesota
- Smaller scale next generation network implementations in Washington DC, the MARC (Kansas City area), Allegheny County PA
- Some of these include various levels of NG9-1-1 features
- The Federal DOT project is targeted to demonstrating core NG9-1-1 capabilities in a 2Q 2008 Proof of Concept demo

IP Network and NG9-1-1 Activity

- IP Ntwk_Planned
- IP Ntwk_State
- IP Ntwk_SubState
- NG911 Prep_State



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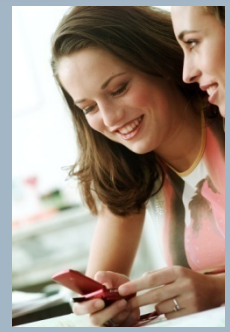
NG9-1-1 Motto

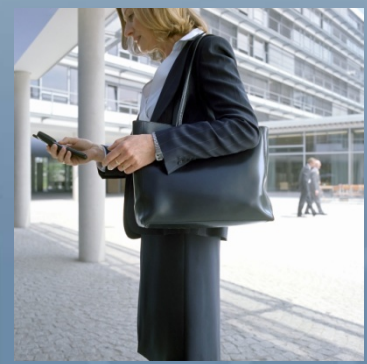







ANY DEVICE, ANY TIME, ANYWHERE!



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Any Device

Person Initiated Examples

- Video or Photo from Cell Phone
- Text Messaging/Instant Messaging

Non-Person Initiated Examples:

- Highway Cameras/Security Cameras
- Alarms
- Sensors
- Personal Medical Devices
- Telematics
- Consumer Electronics in Cars

Any Time

- Interoperability
- Disaster Planning
- Special Events Call Management
- Overflow and Alternate Routing
- Rights Management
- Data Management

Anywhere

- Location Determination
  - Civic address, IP address and X,Y (Z?)
- IP-based or compatible devices will send their location as part of the emergency call or text message.
- Passing Info to First Responders
- Virtual PSAP
  - Dynamic Staffing
  - Disaster Call Management

IP Networks Supporting NG9-1-1

- Use IP networks as they develop (9-1-1 or other existing public safety network)
- County, regional, state, national
- Link together as a network of networks, nationally and beyond
- NG9-1-1 functions run on the IP networks and must meet NG9-1-1 standards
- Security issues must be addressed
- Expanded data access with wide area/national emergency communications capabilities

Why is it Time for NG9-1-1?

- Resolving Infrastructure Limitations
- Equal Access for Hearing Impaired
- More Functionality
- Fast Data Sharing with PSAPs, and other emergency service providers & responders
- Need for National and International Interoperability
- Interoperability with N11s and 800#s
- Prepare for Unpredictable Future Services
- ANY DEVICE, ANY TIME, ANYWHERE. . .

What Can We Expect? Basic Objectives for NG9-1-1

- 9-1-1 calls from any networked communication device, with automatic location
- Call access, transfer, and backup among PSAPs and between PSAPs and other authorized emergency organizations without geographic restrictions
- Open, non-proprietary, and secure architecture to facilitate the implementation of an interoperable system of systems for **all emergency organizations**

What has to be done to make NG9-1-1 Available?

- Funding evolution
- Policy evolution, jurisdiction issues
- Standards and technology development
- PSAP/Emergency response operational modifications
- Leadership at all levels of government
- Wide-ranging education needs
- Regulation & Legislative changes

Example Activity Toward NG9-1-1

- USDOT Project Sites
  - Three Labs, national IP network, Five PSAPs, One state IP network
  - Rochester, St Paul, Helena, Seattle,
  - Indiana IP network and Ft Wayne PSAP
- State Programs – VT, IN, TN, AL, MD
- Strategic Plans in many other states

USDOT NG9-1-1 Project

- Two Year Project (2007-2008)
- Prepare for and Conduct a 6 month `Proof of Concept' Trial (mid-2008)
- Develop and Validate Core Requirements for the Next Generation 9-1-1 (NG9-1-1) System
- Define a System Architecture
- Develop a Transition Plan for Deploying IP-Based Emergency Services Across America.
- Booz Allen Hamilton, prime contractor
  - Project Team: NENA, L Robert Kimball Associates, Texas A&M University

Info at: www.its.dot.gov/ng911

USDOT NG9-1-1 Project

Long Term Goal:

- R&D to design a system that enables the transmission of voice, data or video from different types of communication devices to the Public Safety Answering Points (PSAPs) and on to emergency responder networks.

Major Milestones: to be accomplished during this two year project

- National Architecture and High-Level Design for NG9-1-1 System
- Proof of Concept
- Transition Issues for NG9-1-1 Implementation

Stakeholders in Transition

- General public – emergency callers
- 9-1-1 Authorities/State 9-1-1 agencies
- Local PSAPs and other emergency response agencies
- Public safety and industry organizations – APCO, NENA, CTIA, etc.
- Local/State/Federal Governments
- Standards Development Orgs – SDO's
- 9-1-1 System Service Providers (ILECs)
- Originating Service Providers and national call centers (telematics, TRS, VRS, other N-1-1s, etc.)
- Vendors, Equipment Manufacturers and distributors

This will require significant cooperation!

Working Together To Make NG9-1-1 A Reality

- Understand that underlying network/technology needed for NG9-1-1 is also needed for ALL emergency communications (high bandwidth voice, data, video)
- Promote policies that jointly support 9-1-1 and emergency communications as one “emergency response enterprise”
- Encourage federal and state homeland security policy to include NG9-1-1/emergency communications
- Help/encourage coordination of all efforts and stakeholders within states
- Facilitate/participate in NG9-1-1 development and trials

Working Together To Make NG9-1-1 A Reality

- Assist efforts to update statutes and regulations to enable NG9-1-1 (state and federal)
  - -e.g. Washington State NG9-1-1 Working Group
  - -HR 3403/S 428 (liability, NG report, grant eligibility)
  - -Resolving legal & jurisdictional issues through statutes/regs
- Help secure funding for NG9-1-1 (state/federal)
- Education: Promote NG9-1-1 within membership of public safety and state/local government organizations
  - -Publications and meetings

Saddle Up Your Horses – We've Got Trails to Blaze!

- Thanks for having us
- We can't be successful without your help in this Next Generation EMERGENCY COMMUNICATIONS EFFORT
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Q and A

What makes it an ESInet?

Reference Structure